



ABSTRACT

The present invention provides sensitive methods for detecting the presence or absence of a difference between related nucleic acid sequences. In one aspect of the invention, a method is provided for detecting a difference in the sequence of two nucleic acid molecules. The method includes the steps of: contacting two nucleic acids under conditions that allow the formation of a four-way complex and branch migration; contacting the four-way complex with a tracer molecule and a detection molecule under conditions in which the detection molecule is capable of binding the tracer molecule or the four-way complex; and determining binding of the tracer molecule to the detection molecule before and after exposure to the four-way complex. Competition of the four-way complex with the tracer molecule for binding to the detection molecule indicates a difference between the two nucleic acids. The methods disclosed can be used for detecting nucleotide variations or mutations of an organism, for example, single nucleotide polymorphisms (SNP), which leads to identification of genetic traits associated with diseases or other phenotypic characteristics.